300 ADOT Hazard Elimination System (HES) Program

This guide has been developed by the Arizona Department of Transportation (ADOT) to assist Metropolitan Planning Organizations and Councils of Government (COG) and their sponsoring agencies with developing high accident location safety improvement projects in conformance with the Federal-Aid Hazard Elimination Program (HES) and ADOT's Action Plan. The objective of the ADOT HES program is to reduce the number and severity of crashes and decrease the potential for crashes on state highways and qualifying local roadways.

Projects under this program are developed in a manner similar to other Federal-Aid highway projects. However, proposed projects will not be approved for Federal-Aid funding until they are evaluated by ADOT and the Federal Highway Administration (FHWA) and found to meet eligibility criteria. The project development and design process will normally take 18 to 24 months to process from Design Concept Report submittal to bid advertisement.

Any reports, lists or data used for the development of safety projects under this program are not subject to discovery or admittance into evidence in court proceedings per US Code: Title 23, Section 409.

310 FUNDING

Title 23, Section 152 and Section 133(d)(1) of the United States Code requires that ten percent of funds apportioned to each State's Surface Transportation Program must be set aside for safety improvements ($11,146,000 was set aside for safety improvement projects in the 1999 Federal fiscal year). Of that ten percent, the State is required to set aside an amount not less than the 1991 Federal fiscal year apportionment to the Highway-Rail Crossings Program ($1,576,000) and the Hazard Elimination Program ($2,025,000). ADOT, under its own discretion, may allocate the remaining safety improvement funds to either program and has opted to allocate them to the HES.

In an effort to improve the safety of the entire surface transportation system, ADOT has set aside 25 percent of the HES funds for safety improvement projects on local government projects. These funds will be available on a "first come, first served" basis and will only be available for that fiscal year. In fiscal year 2002, $1,682,000 was available in obligation authority for local government safety projects.

Approved safety improvement projects will be funded at 94.3 percent Federal HES funds, and the remaining 5.7 percent funded by the project sponsor. A maximum participation of $500,000 in HES funds is allowed per project.

Approved safety improvement projects may also be approved for consolidation with overlapping, abutting, and nearby projects. Under this scenario the projects can be developed independently, and will normally be combined and bid and constructed under a single construction contract. The safety improvement project will be funded with HES

funds at the 94.3/5.7 percent participation rate, and the overlapping, abutting, or nearby highway project will be funded under the appropriate participation rates.

320 IMPROVEMENTS ELIGIBLE FOR HES FUNDS

Virtually any type of public surface transportation facility improvement, including bicycle and pedestrian facilities, may be approved for Federal-Aid funding provided that the sole purpose of the improvement is to eliminate traffic hazards or to substantially improve safety. While highway, intersection, and drainage capacity enhancement may be a by-product of the safety improvement, improvements primarily intending to enhance such capacity with safety as a by-product will not be approved. Typical examples of eligible safety improvements are as follows:

- Signing
- Pavement markings, including raised reflectorized pavement markers
- Delineation, including hazard markers
- Channelization
- Horizontal and vertical curve flattening
- Shoulder widening on horizontal curves
- Addition of paved shoulders
- Roadway realignment
- Roadway widening to provide channelization, including two-way left-turn lanes
- Travel lane widening
- Box and pipe culvert extension
- Minor bridge replacement (The Bridge Replacement Program should be considered for this item)
- Sideslope flattening
- Guardrail, including end treatments
- Impact attenuators
- Intersection and section illumination
- Traffic signals and traffic signal upgrades
- Livestock and wild game fencing
- Cattleguards associated with fencing
- Removal of sign obstructions
- Removal of fixed objects
- Bridge approaches
- Design
- Right of Way
- Utility Relocation
- Longitudinal rumble strips
- Emergency Vehicle Preemption
- Traffic calming

321 Non-Eligible Improvements

The following improvements are not eligible for HES funding:

- Any safety improvement on a non-public surface transportation facility
- Any improvement principally intending to enhance highway, intersection, or drainage capacity
- Any Railroad-Highway grade crossing improvements, contact ADOT's Utility and Railroads Section for funding requirements
- Most bridge replacements, contact ADOT's Local Government Section for funding requirements

330 ESTABLISHING PROJECT ELIGIBILITY

It is the intent of the Hazard Elimination Program to:

(a) identify existing and/or potential high accident locations on all public surface transportation facilities
(b) to prioritize those locations
(c) to evaluate and systematically improve traffic safety at those locations by rational and economic means, and
(d) to evaluate the effectiveness of safety improvements.

In determining eligibility of safety improvement projects for HES funds, ADOT and FHWA will evaluate projects with respect to the following:

- The proposed project must be located on a public surface transportation facility.
- The project proposal should indicate that the project location was identified on the basis of an evaluation of traffic accident experience/potential system wide.
- Multiple project requests should be ranked on the basis of benefit/cost (B/C) ratio (preferred) or traffic accident rate.
- Federal-Aid funding for each project must not exceed $500,000 without ADOT approval.
- The project proposal should be in the form of a traffic accident and safety improvement analysis. If in the form of a Design Concept Report, the proposed project should address project justification in terms of traffic engineering practices.
- The project proposal should address:
  a) Specific project location.
  b) Existing surface transportation facility culture and conditions.
  c) Traffic accident experience, including locations, patterns and severity for at least the most recent three (3) year period. A Collision Diagram should be provided. Where accident potential is considered over accident experience, justification should be presented on the rationale of the proposed project over other projects with accident experience.
  d) Current traffic volume/turning movements on all approaches to the project location.
  e) Safety improvement strategy.

f) Estimate of expected public benefits, incorporating accident reduction factors.
g) Estimate of improvement costs.
h) B/C ratio.

- The project proposal should be economically sound with a B/C ratio of at least 1.00.

340 PROJECT DEVELOPMENT

This section lists milestones in the project selection and development process.

1. Survey jurisdictional surface transportation facilities with respect to physical features, usage conditions, and traffic accident experience/potential.

2. Conduct traffic engineering accident, improvement, and economic analyses at high accident and potentially high accident/high severity locations.

3. Select and rank improvement projects by B/C ratio (preferred) or traffic accident rate.

4. Prepare project proposals, including multi-year proposals in traffic engineering studies format or Design Concept Report format and submit to ADOT Local Government Section for eligibility determination.

5. Submit approved project to MPO/COG for programming in the 5-Year Transportation Improvement Program. When project estimates exceed the annual allocation of HES funds, ADOT will rank projects for programming.

6. Sponsor deposits a technical review fee with ADOT. The fee is typically $10,000.00 and covers the required technical reviews by ADOT staff and supplemental services personnel.

7. Submit Design Concept Report to ADOT Local Government Section.

8. Project development and design proceeds to construction in accordance with activities described in Section 200 of this manual and the ADOT Action Plan.

9. After projects are constructed, one (1) year and two (2) year "Before and After" traffic engineering accident analyses must be prepared to illustrate improvement effectiveness and to meet Federal program requirements. The one and two year analyses should be forwarded to ADOT Local Government Section. The results of these analyses are incorporated in an annual report to FHWA on the effectiveness of the Statewide Highway Safety Improvement Program.

341 Accident Data

Traffic accident data is the principle input to traffic safety evaluations. Jurisdiction wide data may be obtained from local police agency files or from ADOT's Traffic Records

Section in various formats. Electronic data is also available in a variety of formats from ADOT. Jim Williams, ADOT Traffic Records Manager, can be contacted at 602-712-7132 for available data.

For most Arizona agencies, an annual or multi-year accident spot map is an excellent method for locating accidents and identifying locations for evaluation. For large agencies, computer analysis may be necessary to identify such locations. No specific method of identifying locations is required, and any method used should be based on agency needs and capabilities, and complexity of their safety improvement program.

342 Project Proposals

A specific format for project proposals is not required. However, the project justification should provide sufficient detail to enable the reviewers to clearly understand the rationale of project selection and the relationships between the existing roadway environment, traffic accident experience/potential, proposed safety improvement, and economic effects. The Manual of Traffic Engineering Studies published by the Institute of Transportation Engineers may be used as a guide.

Accident reduction factors for typical safety improvements are available from Reed Henry, ADOT Traffic Engineering Group, at 602-712-7374.

Traffic accident cost information which may be used in benefit/cost analyses is available from the ADOT HES Section, 2828 North Central Avenue, Suite 900, Maildrop 065R, Phoenix, Arizona 85004, or by phone (602) 712-8873. These costs are periodically adjusted to reflect statewide accident experience. Current accident cost information is available.

An example of the benefit/cost analysis is presented on the ADOT Traffic Engineering Group website, www.dot.state.az.us/ROADS/traffic/pgp.htm.

For additional information, please contact Randy Allenstein, ADOT Local Government Engineer at 602-712-7109 or e-mail at rallenstein@dot.state.az.us.

REFERENCES

A Guide to Federal-Aid Programs and Projects, May 1999, published by FHWA, Publication No. FHWA-IF-99-006.